

1. A method of consolidating a zone or formation comprising:

(a) drilling the zone or formation with a drilling fluid having a pH in the range of from about 6 to about 10 and that comprises water and a polymeric cationic catalyst capable of accepting and donating protons; and

(b) contacting the zone or formation with a treating fluid having a pH in the range of from about 6 to about 10 and that comprises water, a water soluble or dispersible polymer which is capable of being cross-linked by a thermoset resin and causing the resin to harden when cured, and a water soluble or dispersible thermoset resin which cross-links the polymer, is catalyzed and cured by the catalyst and consolidates the zone or formation.

2. The method of claim 1 wherein the zone or formation comprises unconsolidated rocks and minerals selected from the group consisting of clays, shales and sand stone and wherein said polymeric cationic catalyst is adsorbed on the rocks and minerals in the zone or formation.

3. The method of claim 1 wherein the polymeric cationic catalyst is selected from the group consisting of polyethyleneimine, poly(dimethylaminoethylmethacrylate) and poly(dimethylaminopropylmethacrylate).

4. The method of claim 1 wherein the water soluble or dispersible polymer which is cross-linked by the thermoset resin is selected from the group consisting of polymers containing one or more of hydroxyl, amide, carboxyl and epoxy functional groups.

5. The method of claim 1 wherein the water soluble or dispersible polymer which is cross-linked by the thermoset resin is selected from the group consisting of polyvinylalcohol, polyvinylbutyral, polyesters, polyalkylacrylic acids, polyurethanes, acrylamide polymers, proteins, polyols and polysaccharides.

6. The method of claim 5 wherein the polysaccharides are selected form the group consisting of chitosan, hydroxyethylcellulose, carboxymethylhydroxyethylcellulose, water soluble starches, guar gum, xanthan gum, welan gum, carragenan gum and arabic gum.

7. The method of claim 1 wherein the water soluble or dispersible thermoset resin is selected from the group consisting of melamine-formaldehyde type resins, urea-formaldehyde type resins and phenol-formaldehyde type resins.

8. The method of claim 1 wherein the water soluble or dispersible thermoset resin is selected from the group consisting of an alkyl ether of a melamine-formaldehyde resin and an alkyl ether of a urea-formaldehyde resin.

9. The method of claim 1 wherein the polymeric cationic catalyst is present in the drilling fluid in an amount in the range of from about 1% to about 15% by weight of water in the drilling fluid.

10. The method of claim 1 wherein the polymer which is cross-linked by the thermoset resin is present in the treating fluid in an amount in the range of from about 0.5% to about 20% by weight of water in the treating fluid.

11. The method of claim 1 wherein the thermoset resin is present in the treating fluid in an amount in the range of from about 5% to about 80% by weight of water in the treating fluid.

12. The method of claim 1 wherein the drilling fluid and treating fluid both have a pH of about 8.

13. A method of consolidating a zone or formation while drilling a well bore penetrating the zone or formation comprising:

(a) drilling the well bore with a drilling fluid having a pH in the range of from about 6 to about 10 and that comprises water and a polymeric cationic catalyst capable of accepting and donating protons; and

(b) contacting the well bore with a treating fluid having a pH in the range of from about 6 to about 10 and that comprises water, a water soluble or dispersible polymer which is capable of being cross-linked by a thermoset resin and causing the resin to harden when cured, and a water soluble or dispersible thermoset resin which cross-links the polymer, is catalyzed and cured by the catalyst and consolidates the zone or formation.

14. The method of claim 13 wherein the zone or formation comprises unconsolidated rocks and minerals selected from the group consisting of clays, shales and sand stone and wherein said polymeric cationic catalyst is adsorbed on the rocks and minerals in the zone or formation.

15. The method of claim 13 wherein the polymeric cationic catalyst is selected from the group consisting of polyethyleneimine, poly(dimethylaminoethylmethacrylate) and poly(dimethylaminopropylmethacrylate).

16. The method of claim 13 wherein the water soluble or dispersible polymer which is cross-linked by the thermoset resin is selected from the group consisting of polymers containing one or more of hydroxyl, amide, carboxyl and epoxy functional groups.

17. The method of claim 13 wherein the water soluble or dispersible polymer which is cross-linked by the thermoset resin is selected from the group consisting of polyvinylalcohol, polyvinylbutyral, polyesters, polyalkylacrylic acids, polyurethanes, acrylamide polymers, proteins, polyols and polysaccharides.

18. The method of claim 17 wherein the polysaccharide is selected from the group consisting of chitosan, hydroxyethylcellulose, carboxymethylhydroxyethylcellulose, water soluble starches, guar gum, xanthan gum, welan gum, carragenan gum and arabic gum.

19. The method of claim 13 wherein the water soluble or dispersible thermoset resin is selected from the group consisting of melamine-formaldehyde type resins, urea-formaldehyde type resins and phenol-formaldehyde type resins.

20. The method of claim 13 wherein the water soluble or dispersible thermoset resin is selected from the group consisting of an alkyl ether of a melamine-formaldehyde resin and an alkyl ether of a urea-formaldehyde resin.

21. The method of claim 13 wherein the polymeric cationic catalyst is present in the drilling fluid in an amount in the range of from about 1% to about 15% by weight of water in the drilling fluid.

22. The method of claim 13 wherein the polymer which is cross-linked by the thermoset resin is present in the treating fluid in an amount in the range of from about 0.5% to about 20% by weight of water in the treating fluid.

23. The method of claim 13 wherein the thermoset resin is present in the treating fluid in an amount in the range of from about 5% to about 80% by weight of water in the treating fluid.

24. The method of claim 13 wherein the drilling fluid and treating fluid both have a pH of about 8.

25. A method of consolidating a zone or formation while drilling a well bore penetrating the zone or formation comprising: (a) drilling the well bore with a drilling fluid having a pH of about 8 and that comprises water, a cationic, polyethyleneimine catalyst which is adsorbed on the zone or formation and is present in the drilling fluid in an amount in the range of from about 2% to about 10% by weight of water in the drilling fluid; and (b) contacting the well bore with a treating fluid having a pH of about 8 and that comprises water; a polysaccharide polymer which is capable of being cross-linked by a thermoset resin and causing the resin to harden when cured present in an amount in the range of from about 1% to about 10% by weight of water in the treating fluid; and an alkyl ether of a melamine-formaldehyde resin which cross-links the polymer, is catalyzed and cured by the catalyst, consolidates the zone or formation, and is present in an amount in the range of from about 20% to about 70% by weight of water in the treating fluid.

26. A method of consolidating a zone or formation formed of clay, shale and/or sandstone while drilling a well bore penetrating the zone or formation comprising:

(a) drilling the well bore with a drilling fluid having a pH in the range of from about 6 to about 10 and that comprises water and a polymeric cationic catalyst capable of accepting and donating protons and which is adsorbed on the unconsolidated clay, shale and/or sandstone; and

(b) contacting the well bore with a treating fluid having a pH in the range of from about 6 to about 10 and that comprises water, a water soluble or dispersible polymer which is capable of being cross-linked by a thermoset resin and causing the resin to harden when cured, and a water soluble or dispersible thermoset resin which cross-links the polymer, is catalyzed and cured by the catalyst and consolidates the zone or formation.

27. The method of claim 26 wherein the polymeric cationic catalyst is selected from the group consisting of polyethyleneimine, poly(dimethylaminoethylmethacrylate) and poly(dimethylaminopropylmethacrylate).

28. The method of claim 26 wherein the water soluble or dispersible polymer which is cross-linked by the thermoset resin is selected from the group consisting of polymers containing one or more of hydroxyl, amide, carboxyl and epoxy functional groups.

29. The method of claim 26 wherein the water soluble or dispersible polymer which is cross-linked by the thermoset resin is selected from the group consisting of polyvinylalcohol, polyvinylbutyral, polyesters, polyalkylacrylic acids, polyurethanes, acrylamide polymers, proteins, polyols and polysaccharides.

30. The method of claim 29 wherein the polysaccharide is selected from the group consisting of chitosan, hydroxyethylcellulose, carboxymethylhydroxyethylcellulose, water soluble starches, guar gum, xanthan gum, welan gum, carragenan gum and arabic gum.

31. The method of claim 26 wherein the water soluble or dispersible thermoset resin is selected from the group consisting of melamine-formaldehyde type resins, urea-formaldehyde type resins and phenol-formaldehyde type resins.

32. The method of claim 26 wherein the water soluble or dispersible thermoset resin is selected from the group consisting of an alkyl ether of a melamine-formaldehyde resin and an alkyl ether of a urea-formaldehyde resin.

33. The method of claim 26 wherein the polymeric cationic catalyst is present in the drilling fluid in an amount in the range of from about 1% to about 15% by weight of water in the drilling fluid.

34. The method of claim 26 wherein the polymer which is cross-linked by the thermoset resin is present in the treating fluid in an amount in the range of from about 0.5% to about 20% by weight of water in the treating fluid.

35. The method of claim 26 wherein the thermoset resin is present in the treating fluid in an amount in the range of from about 5% to about 80% by weight of water in the treating fluid.

36. The method of claim 26 wherein the drilling fluid and treating fluid both have a pH of about 8.

37. A method of consolidating a zone or formation formed of clay, shale and/or sand stone while drilling a well bore penetrating the zone or formation comprising: (a) drilling the well bore with a drilling fluid having a pH of about 8 and that comprises water, a cationic, polyethyleneimine catalyst which is adsorbed on the unconsolidated clay, shale and/or sand stone and is present in the drilling fluid in an amount in the range of from about 2% to about 10% by weight of water in the drilling fluid; and (b) contacting the well bore with a treating fluid having a pH of about 8 and that comprises water; a polysaccharide polymer which is capable of being cross-linked by a thermoset resin and causing the resin to harden when cured present in an amount in the range of from about 1% to about 10% by weight of water in the treating fluid; and an alkyl ether of a melamine-formaldehyde resin which cross-links the polymer, is catalyzed and cured by the catalyst, consolidates the zone or formation, and is present in an amount in the range of from about 20% to about 70% by weight of water in the treating fluid.